CLAIMS

1. A diffractive data storage system for recording data from a data source on diffractive optics memory, comprising :

a coherent light source split to form an object beam and a corresponding reference beam, the object beam being modulated by the data by means of transmission through a display encoding the data inputted by the data source in a two-dimensional pattern of transparent and opaque pixels and focused on said memory following an optical axis perpendicular to a plane of said memory

a steering mirror configured to direct said reference beam received from said coherent light source ;

a first plurality of mirrors arranged around one side of said optical axis receiving said reference beam from said steering mirror, each of said first plurality of mirrors directing said reference beam at a corresponding first angle of a plurality of first angles towards said memory ; and

a second plurality of mirrors arranged around the symmetrical side of said optical axis receiving said reference beam from said steering mirror, each of said second plurality of mirrors directing said reference beam at a second angle of a plurality of second angles towards said memory, said first angle being identical in value to said second angle but formed on the symmetrical side of said optical axis ;

said memory comprising a plurality of points storing data therein, said object beam and said reference beam interfering at said first angle to form a first sub-hologram at one of said points of said memory and said reference beam interfering with said object beam at said second angle to form a second sub-hologram at said point, and

said memory being mechanically shifted so that data are recorded at different points of said memory.

2. The diffractive storage system of claim 1, wherein said memory comprises a polypeptide plate on which data is recorded.

3. The diffractive storage system of claim 1, wherein said steering mirror is a rotating mirror.

4. The diffractive storage system of claim 1, wherein said steering mirror is a Micro Opto Electro Mechanical System.

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5. The diffractive storage system of claim 1, wherein the display is a spatial light modulator.

6. the diffractive storage system of claim 1, wherein the display is a liquid crystal light wave.

7. The diffractive storage system of claim 1, wherein said memory is made of a polypeptide material.

8. The diffractive storage system of claim 1 wherein the steering mirror is placed between said display and said memory

9. A diffractive storage method for recording data from a data source on a diffractive optics memory, comprising the steps of :

forming an object beam and a reference beam coherent with said object beam;

modulating the object beam by the data by means of transmission through a display encoding the data inputted by the data source in a two-dimensional pattern of transparent and opaque pixels and focusing the object beam on said memory following an optical axis perpendicular to a plane of said memory

directing said reference beam at a first angle of a first plurality of angles towards said memory by a corresponding one of a first plurality of mirrors arranged around one side of said optical axis ; and

directing said reference beam at a second angle of a second plurality of angles towards said memory by a corresponding one of a second plurality of mirrors arranged around the symmetrical side of said optical axis, said first angle being identical to said second angle but formed on the symmetrical side of said optical axis;

said memory comprising a plurality of points storing data therein, said object beam and said reference beam interfering at said first angle to form a first sub-hologram at one of points of said memory and said reference beam interfering with said object beam at said second angle to form a second sub-hologram at said point,

shifting said memory so that data are recorded at different points of said memory.

10 The diffractive storage method of claim 9, further comprising a MEOMS which directs said reference beam to one of said plurality of mirrors.

11. The diffractive storage method of claim 9, wherein said memory is made of a polypeptide material.

12. The diffractive storage method of claim 9, wherein said object beam has modulated thereon a plurality of pixels.

13. A diffractive data storage system for reading data from a diffractive optics memory having a plurality of points, comprising:

a coherent light source forming a reference beam, an optical axis being defined by said reference beam being aligned perpendicular to a plane of said memory;

a steering mirror configured to direct said reference beam received from said coherent light source to said memory;

a first plurality of mirrors arranged around one side of said optical axis receiving said reference beam from said steering mirror, each of said first plurality of mirrors directing said reference beam at a corresponding first angle of a plurality of first angles towards one of said points of said memory;

a second plurality of mirrors arranged around the symmetrical side of said optical axis receiving said reference beam from said steering mirror, each of said second plurality of mirrors directing said reference beam at a corresponding second angle of a plurality of second angles towards said one of said points of said memory, said first angle being the same value as said second angle but formed on the symmetrical side of said optical axis, and

an array of light sensitive elements configured to detect a first reconstruction beam of a first packet of data at said point of said memory illuminated with said reference beam and to detect a second reconstruction beam of a second packet of data at said point of said memory illuminated with said reference beam.

14. The diffractive storage system of claim 13, wherein said steering mirror is a Micro Opto Electro Mechanical System.

15. The diffractive storage system of claim 13, wherein said steering mirror is located on said optical axis directing said reference beam to one of said plurality of mirrors.

16. The diffractive storage system of claim 13, wherein said memory is made of a polypeptide material.

17. A diffractive data storage method for reading data from a diffractive optics memory, comprising the steps of:

directing a reference beam at a first angle of a first plurality of angles towards a first plurality of mirrors arranged around one side of an optical axis, said optical axis defined by said reference beam perpendicular to said memory;

reconstructing a first packet of information at a point of said memory with said reference beam;

detecting the first reconstructed packet with an array of light sensitive elements

directing said reference beam at a second angle of a second plurality of angles towards a second plurality of mirrors, said first angle being identical in value and symmetrical about said optical axis to said second angle;

reconstructing a second packet of information at said point of said memory with said reference beam, and

detecting the second reconstructed packet with an array of light sensitive elements.

18. The diffractive storage method of claim 17, wherein said memory is made of a polypeptide material.